

The Wrack Line

Newsletter of Parker River National Wildlife Refuge • Newburyport, MA



United States Fish & Wildlife Service

Spring, 2015

Saving the Monarch Butterfly, One Yard at a Time

By Katie Banks Hone

Almost every student in America can recall raising a monarch butterfly caterpillar in their classroom. In just two weeks the insect grows from a tiny speck to the size of our thumb. In human terms that would be like a newborn baby growing to the size of a school bus in just 14 days. Then the caterpillar splits its skin for the last time revealing a jeweled chrysalis in which it rearranges its entire body and emerges as the beloved orange and black butterfly we all know.

Last fall, millions of these monarchs left the northern U.S. and southern Canada and flew up to 3,000 miles to a tiny patch of cool forest high in the mountains of central Mexico where they've never been before. Huddled together in masses so thick they cover the trees, they spent the winter in diapause, nearly shutting their bodies down conserving fat and awaiting the spring. Right now, these monarchs are waking up, searching for water and getting their bodies, that weigh less than a paper clip, ready to make their way *another* 1,000 miles north towards Texas, looking for the only plant on which they lay their eggs: milkweed.

Every year since my young girls and I planted milkweed in our Ipswich native gardens we've had a steady stream of monarchs, even getting eggs which we raised to adults. Last summer, however, the monarchs didn't come. We waited and waited. Not a single egg. It was the mystery of the missing monarchs.

Unfortunately, habitat destruction and herbicides have removed so much of the monarch caterpillar's only food source that the population of this cherished butterfly has declined by 90%. Only about 56.5 million monarchs are thought to remain. Scientists estimate that we need to create a million and a half acres of new habitat each year to grow the eastern monarch population to 300 million butterflies by 2024.

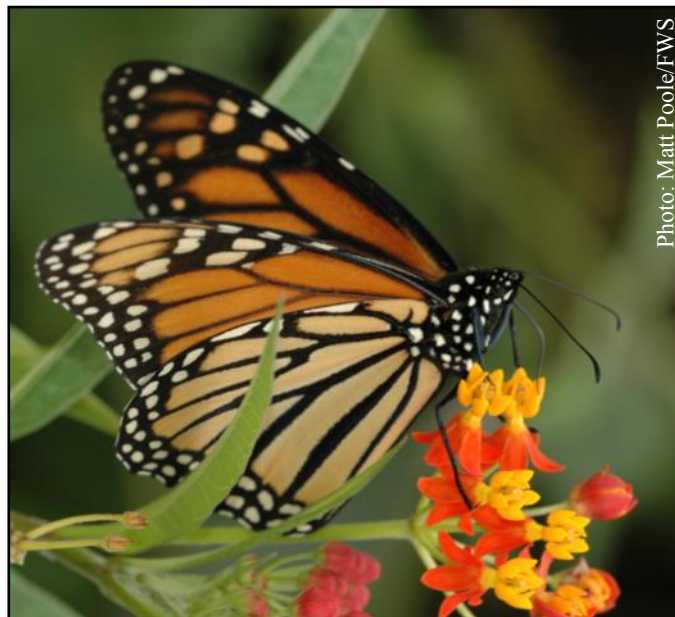


Photo: Matt Poole/FWS

To the average property owner with a small yard this may seem an impossible task. But, every yard that has milkweed adds to that acreage goal. And unlike many species that suffer from habitat loss, monarchs don't need contiguous habitat. Small fragmented patches in gardens and backyards work well for restoring populations.

Adding native milkweed to your yard (and the 'native' part is critical for the monarch) is not only easy, it's something *you* can do to help. Creating a monarch waystation in a New England yard simply means planting native nectar plants as well as swamp milkweed (*Asclepias incarnata*) and butterflyweed (*Asclepias tuberosa*), two locally native milkweed species more suited to a small garden than the common milkweed (*Asclepias syriaca*) normally seen in meadows. And if you have a meadow or a big yard, go ahead and plant common milkweed there too!

As the summer of 2014 carried on and the monarchs still didn't appear in our waystation my girls and I realized we needed to think beyond our own yard if they were going to raise monarchs with their future children. Last spring I obtained a flat of swamp milkweed seedlings and asked everyone in our neighborhood to take

one and add it to their gardens. Now another 21 houses have milkweed, 50 percent of our neighborhood. One neighbor even reported a monarch in her yard.

Looking beyond your neighborhood, native milkweed can be easily added, with permission, to existing public gardens, at playgrounds, parks, libraries and schools. This past summer I added swamp milkweed and butterflyweed to an existing garden at a favorite Ipswich playground. Three weeks later we found three monarch eggs. We raised them and sent them on their way to Mexico this past September. Those six plants made a difference.

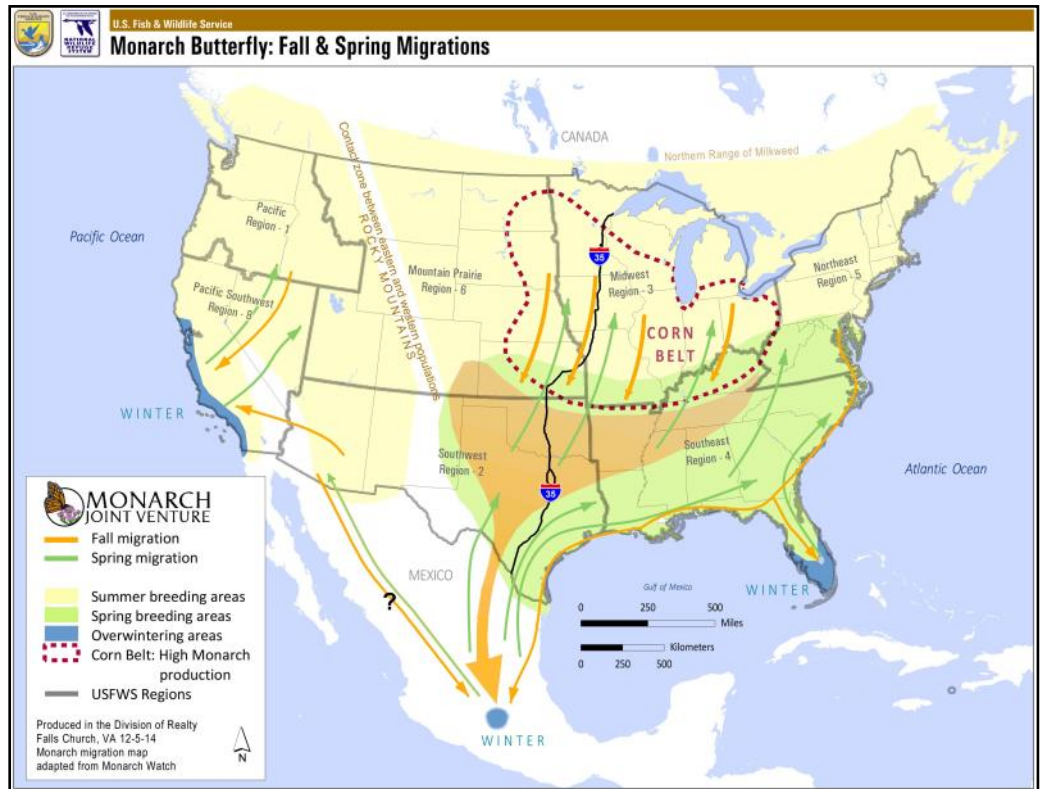


Photo: Matt Poole/FWS

A monarch caterpillar feeds on a common milkweed leaf. A key element in the effort to conserve monarchs is pretty simple: more milkweed means more monarchs!

Many people ask me, "So why should I care about a little butterfly?" Beyond the simple beauty of the animal and its astonishing 3,000 mile migration, it is also a pollinator. By creating habitat for the monarch butterfly you are also creating habitat for hundreds of other pollinator species. Not only are pollinators beautiful and work hard in your private garden, but they contribute heavily to the U.S. economy by pollinating food crops. And other pollinators, such as the honey bee, are on the decline as well.

Even if you have a tiny backyard, and a few plants seem like an inconsequential tiny drop in the bucket, millions of tiny drops add up to milkweed oceans. By creating this milkweed ocean on public and private lands, it is entirely possible to sustain the monarch butterfly and its migration. Every milkweed plant counts.



Let's Go Outside!

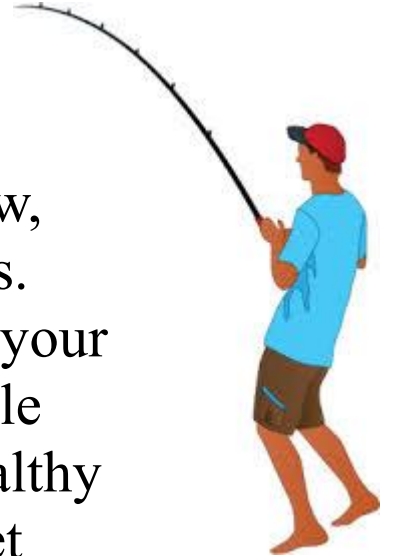
Save the date!

Saturday, June 20th

10:00 am to 3:00 pm

Parker River will be hosting a new,
FREE event for kids and families.

Spend all or part of a day outside at your local national wildlife refuge while trying out a whole bunch of fun, healthy activities including archery target shooting, kayaking, surf fishing, nature photography, and bird watching. There will also be very cool nature-based arts & crafts for younger kids.



Keep your eyes on the local newspapers and refuge web site for event updates!



-ADVERTORIAL-

Banding Together to Save the New England Cottontail

By Kaytee Hojnacki, Biological Technician, and Nancy Pau, Wildlife Biologist

In August of 2012, Great Bay National Wildlife Refuge collaborated with the Wildlife Institute and NH Fish and Game to build a hardening pen for New England cottontail (*Sylvilagus transitionalis*); the only native and unique (endemic) cottontail of New England. The New England cottontail may look like the more commonly seen eastern cottontail (*Sylvilagus floridanus*), but is much more of a habitat specialist. These rabbits require very dense thickets, and hesitate to stray from cover. However, with habitat loss due to development and forest maturation, the New England cottontail population has dramatically declined. Plus, expanding highways and roads have further fragmented their habitat. In many locations, the rabbits are holding out in small patches of habitat making it difficult for them to find food or mates.

This brings us back to the captive breeding program. It may be ironic, but these rabbits do need our help to breed. Working together with the US Fish and Wildlife Service, the University of New Hampshire, the University of Rhode Island, and all New England states, the Roger Williams Park Zoo is helping to play matchmaker to the rabbits, hoping that when brought together, the rabbits will



Because there has been significant loss of its required dense thicket habitat, the New England cottontail find itself in need of help.

breed, well, like rabbits! The pilot captive breeding program was initiated in 2011, and several successful litters have come out of the Providence, Rhode Island zoo.

The pen at Great Bay NWR is a one-acre fenced-in area of shrub and thicket habitat where the rabbits can acclimate from their cage living at the zoo to living in the wild. Built to keep most predators out and watched closely by staff, this pen makes it easier for the rabbits than if they were just released to fend for themselves.

On September 19, 2012, lots of excitement swirled around the next group of rabbits to leave the zoo. Heidi Holman, wildlife biologist with New Hampshire Fish and Game Department, loaded up nine rabbits for their ride to the Great Bay NWR. A morning of rain and cold weather had everyone concerned that the transition into the newly created pen would be difficult on the rabbits. But by the time Heidi and the rabbits arrived, the sun was shining – perfect for such a momentous occasion. Staff members from Parker River NWR, and from nearby Rachel Carson NWR, where a lot of work is being done to conserve these rabbits, were on hand to witness the release. Seven pairs of eyes watched anxiously as one by one, each rabbit was taken out of a carrier and placed into their temporary home. They sat a moment, sniffed their new surroundings, and then dashed away into the shrubs.



These two "critter carriers" constitute 1st class travel for New England cottontails making the trek from the zoo in Rhode Island to the hardening pen at Great Bay NWR.

This group of rabbits spent their winter acclimating to the wild in the new pen before being released the following spring at sites in southern New Hampshire in order to supplement wild populations. A second group was brought to the pen in August of 2013 to spend their winter chowing down on twigs within the relative safety of its confines. Although the pen was carefully designed to keep predators out, sometimes animals are smarter than humans. Over the two winters that rabbits were in the pen, several were lost to avian predators, as well as to a fisher that somehow avoided (or ignored) the electric fence wires to climb up and over. Due to this, rabbits only had a short stay in the pen during the summer and fall of 2014 before heading into the wild.

But hope is not lost on the Great Bay hardening pen. Actually, bigger and better things are on the horizon. Adjustments will be made to the pen this spring to further keep predators out. After that happens, a group of four rabbits will be brought in with the hope that they will breed in the pen. This will hopefully be the beginning of a captive breeding program that occurs outside of the zoo, in a more natural environment. Adding additional pens at Great Bay is also a possibility, to further increase the capacity of producing rabbits that can be released to bolster wild populations. Hopefully, one day the New England cottontail will once again be the dominant rabbit of its namesake.



Miscellany Photographica



Common milkweed—one of several native milkweeds that are very important in the life cycle of the monarch butterfly.



A group of “retired” nest boxes that were leaning against a refuge storage building last summer. The tree swallow apparently had not heard that the boxes were no longer being used!

Conservation, *Hollywood Style!*

*By Anne Post, Librarian
National Conservation Training Center*

I love to watch a good film, and when it is nature conservation-related, then I am humming. It's a great way to better understand a conservation issue and the science behind the narrative.

The American Conservation Film Festival (ACFF), held every fall in Shepherdstown, West Virginia, the location of our National Conservation Training Center, offers a riveting schedule of excellent conservation films that incite a lot of interest around earth stewardship and conservation storytelling.

Film can light a fire under the most indifferent of us by its storytelling power and its use of imagery to inspire action. The idea is this: how do we become part of the solution?

To bring some of the world's award-winning conservation films to eastern Massachusetts, our Parker River National Wildlife Refuge held an inaugural American Conservation Film Festival (ACFF) North and folks in the Newburyport, MA area and beyond poured into the fabulous refuge auditorium to get relief from cabin fever and emerged "fired up" by the nine featured films screened across the weekend.

Award-winning films included *Chasing Ice*, *Flight of the Butterflies*, and the New England premier of *The Power of One Voice: A 50 year Perspective on the Life of Rachel Carson*. Carson, an employee of the U.S. Fish and Wildlife Service at the time, visited the refuge in 1946 and wrote one of the “Conservation in Action” series booklets on Parker River the following year.

“The idea behind the recent film festival at Parker River National Wildlife Refuge was really quite simple: to harness the power of cinema to inform and inspire event participants on a broad range of compelling conservation issues – be they local, national or global,” Matt Poole, Visitor Services manager explained recently, only three days after the resoundingly successful American Conservation Film Festival – North event at the refuge.

Future film festivals at the refuge will likely include discussion forums to bring the passion and “fire” incited by the films to a place where filmgoers learn how and where they can take action, and build community around the conservation concern presented in the films.

Beyond the fire of it all, there were some very simple expressions of appreciation for our efforts to offer an enjoyable and meaningful event. Said quite simply by one of our filmgoers: “The event was a wonderful way to spend the afternoon with my children – inspiring and educational.”



Photo: Anne Post/FWS

Warblers: Blurs of Spring Color

By Linda Schwartz, Refuge Master Naturalist

What is spring without a little color and bird song? Spring brings the annual migration of warblers, those beautiful song birds that bring so much life to the woods and fields. Parker River NWR is a well-known stop on the northward migration of these lively birds. Warblers are among the most colorful birds seen here in the Northeast. While many of these birds are just passing through, several stay and breed on the refuge including American redstarts (*Setophaga ruticilla*); yellow warblers (*Setophaga petechial*); common yellow throated warblers (*Geothlypis trichas*); and yellow-rumped warblers (*Setophaga coronata*). (Do I detect a preponderance of "yellow" here?!)

We are in great need of a little color after a very long winter and these little guys will do the trick. Some of the first migrants seen in the spring are pine warblers (*Setophaga pinus*); palm warblers (*Setophaga palmarum*); black and white warblers (*Mniotilta varia*); yellow warblers, and yellow-rumped warblers. (I hope my comment about not having a subnivean environment this year (yet) in the last issue of *The Wrack Line* was not what made Mother Nature show us just what subnivean means...)

Warblers belong to the largest order of birds, that of the Passeriformes, also known as perching birds or songbirds. Passeriformes include more than



Photo: Linda Schwartz

Female yellow warbler

half the species of birds. Warblers comprise one of the largest families of birds in North America. They are also some of the smallest and most colorful birds. Warblers range in size from about 3.5 inches in length to around 6 inches with weights in the range of about .25 ounce to about an ounce or a bit more. For comparison, a house sparrow is from about 5.9–6.7 inches and around 1 ounce to about 1.02 ounces.

There are about 50 species of warblers that breed in the continental United States and Canada. Many warblers are at their most colorful in the springtime (breeding season) and will molt into a less colorful plumage for the fall migration. Some warblers travel all the way to Canada from South America and the West Indies. Others, like the yellow-rumped warbler, only travel as far as the southern part of the US from the Northeastern US breeding area that includes Massachusetts. Most warblers are insectivores, and most are also arboreal. There are terrestrial warblers such as the water thrushes (genus *Seiurus*) and the ovenbird (*Seiurus aurocapilla*).

Many of the warblers utilize the Atlantic Flyway on their journey north. But there are also species that are sometimes known to fly much of their journey over the open ocean. It has recently been discovered that some blackpoll warblers (*Setophaga striata*) are one species that use the pelagic route over the ocean, an amazing feat for such a tiny creature! They win the prize for one



Photo: Linda Schwartz

Palm Warbler



Photo: Linda Schwartz

Male yellow-rumped warbler

of the longest migrations for the warblers. Their fall migration includes over 1000 miles nonstop over the ocean in their journey from Alaska and Canada to Columbia

and Venezuela. This flight includes about 1700 miles over the open ocean – taking about 3 days. In the spring they tend to come north via the Atlantic Flyway and spend most of their time over land.

There is nothing like watching these bright bits of color flit about as they eat insects amongst the trees and bushes. Photographing them can be a very rewarding challenge. They frequently start arriving in mid-April with the peak of the migration occurring about the middle of May and many warblers are passing through until late May. Many of them arrive before the leaves are fully out on the trees allowing for excellent opportunities to see them. There is nothing prettier than a colorful little bird against a backdrop of crabapple blossoms or other flowers.

Warblers can be spotted throughout the refuge in the spring; often you don't even have to leave your car to see them as they are frequently in some of the bushes that line the refuge road. They are frequently heard singing throughout the refuge. Hellcat Swamp is one of the best places to see a wide variety of warblers because of its varied habitat. Many times some of the best birding is around the parking lot or near the bathrooms, all of which can be seen without much walking. I cannot even count how many times I have had some great sightings right in the area of the bathrooms, while waiting for a companion. The old orchard trees attract many insects which in turn attracts many warblers.

The Atlantic Flyway

By Linda Schwartz, Refuge Master Naturalist

Why is Parker River NWR such a good place to see birds? There are a number of reasons such as; habitats and location, location, location. The refuge is situated along what is known as the Atlantic Flyway – basically, a superhighway for birds. There are four major flyways in the United States; Pacific, Central, Mississippi and Atlantic. The Atlantic Flyway is the most relevant one for us. It is one of the most used flyways for birds migrating between North America and Central or South America. Flyways are very general routes that don't have a lot of obstacles, such as mountains, in the way. The refuge provides an excellent place for birds to rest and refuel on their long, seasonal journeys. There are flyways over the oceans, but the birds seen at the refuge are utilizing the Atlantic Flyway.

Refuge habitats include maritime forest, marsh, beach, and both freshwater and saltwater marshes for all kinds of birds and other animals. This means there is food for even the pickiest of eaters. Many national wildlife refuges are located along flyways and were created to preserve habitat for migratory and non-migratory species.



History As Seen Through: **Plum Island Postcards**

By Gerard Brown, Refuge Master Naturalist

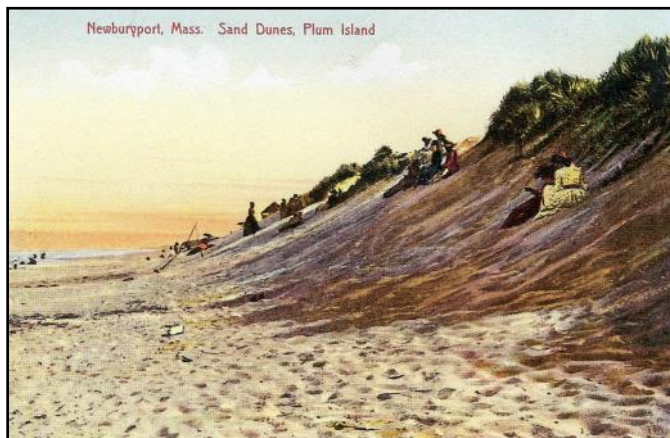
Being an amateur historian, I have often used old picture postcards for gleaning historical information in my research of local Massachusetts history. In fact, a survey of cards that I have acquired or viewed, to date, of Plum Island, MA indicates that there is much to learn from these typically 3" x 5" cards on cardboard or paper stock. First though, a short history of the picture postcards is in order.

The first postcards were produced in the 19th century. The U.S Post Office was responsible for printing post cards up until May 19, 1898, when Congress passed the 'Private Mailing Card Act'. The law allowed for the rapid growth in the picture post card market. The picture postcard era, as we know it, dates from about 1898 to present. Picture postcards were essentially an inexpensive means to communicate with people. It allowed them to jot down a note on the card to relatives, friends, etc., and send via mail. It was in the early 20th century that people began mailing and trading cards with one another and so began the field of post card collecting. This field, now known as deltiology, is a very popular hobby today. One interesting point about old picture postcards, that makes them important historically, is that they record a snapshot of the times in the photo or print. Whether a picture of a building, road, portrait, event, ship or other scenic view, the image on the post card allows one to see what has changed in the view as compared to today. In some cases, it is difficult to ascertain where the view was taken, given the significant changes that have occurred with time. Postcards that have messages inscribed give informational insight into what were on people's minds. Written dates and post marks on the card allows one to estimate their age. The approximate card issue date can likewise be determined by following the general time-line of when a specific card style was produced. A great on-line resource of post card history can be found at <http://siarchives.edu/history/exhibits/postcard/postcard-history>.

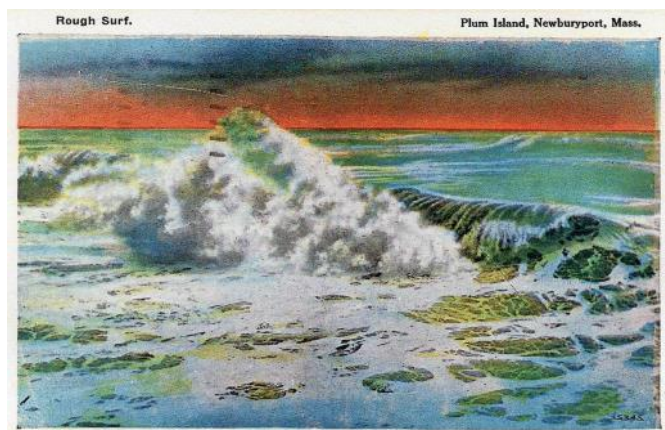
From what Plum Island cards I have viewed over the last couple of years, there are a diverse variety of views. Typical scenes include the lighthouse, the life-saving stations, people relaxing on the beach, the marshes often dotted with salt hay stacks, the jetties, hotels, a theater, people's

cottages, the sand dunes, the airfield, etc. The northern section of the island appears to have been well documented in the picture postcard era. In contrast, what we know today as the refuge was not as comprehensively photographed and hence fewer postcards were made. The main reason is that it was largely uninhabited, albeit for a few hunting camps, cottages, a lifesaving station and hotel.

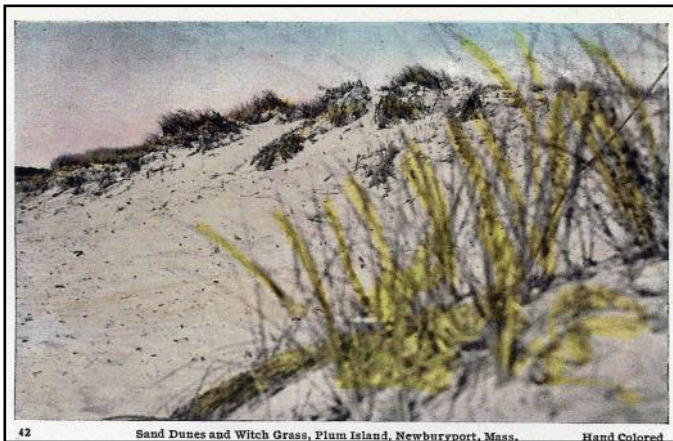
Included below are a few examples of some older postcards of Plum Island, MA. At least one of the cards is from the 'refuge' side of the island. Take a look back and enjoy some Plum Island post card history.



This is a classic view of high dunes (German-made card), published by Hugh Leighton, Portland, ME (circa 1907 - 1915). Storms and beach erosion appeared to have taken their toll over the years, given the dune height in this early view. One note on the manufacturer: the best quality cards came out of Germany in the first decade of the 20th century. The start of WWI would shift large scale card production to the U.S. but these cards typically lacked the high quality of the German lithographic cards. There were some exceptions, (see Frank B. Swallow cards below).



Unknown maker, (postmarked 1937). There is a special appeal in seeing large crashing waves hitting the shore. There are numerous variations of the surf after a storm on Plum Island. The topic was (and still is) very popular.



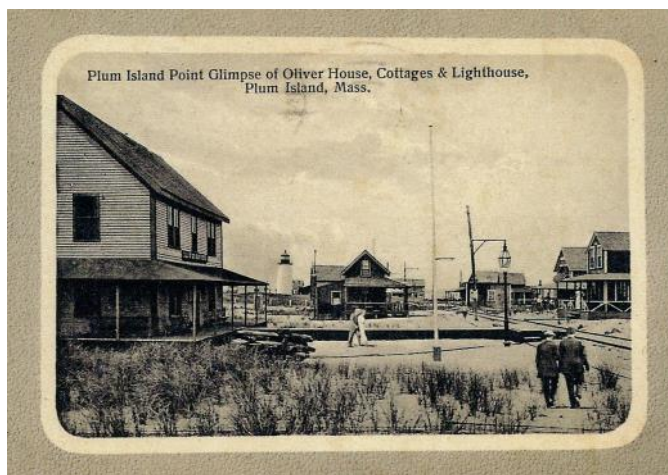
Sand Dunes and Witch Grass, Plum Island, Newburyport, Mass. Hand Colored view by Frank B. Swallow of Exeter, NH (circa 1915 - 1930). The scenic view shows the beauty of the dune habitat. Exact location is unknown. Frank Swallow produced many fine cards of Plum Island and other New England scenes. Many of them are found hand-colored which lends authenticity to the scene.



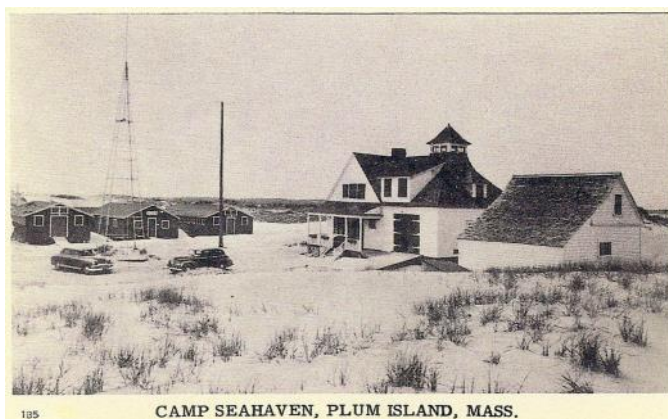
Marsh Scene, Plum Island, Newburyport, Mass. Another hand colored view by Frank B. Swallow of Exeter, NH (circa 1915 - 1930). This occupational scene shows how the salt marsh hay was kept dry during high tides. Exact location is unknown.



Chrome card (post-marked 1969). This is the quintessential photo of people on a typical summer day. The card has a 60s feel to it. The image needs no explanation as to why it is necessary to cordon off the refuge beaches during piping plover and tern nesting season.



Published for Chas. Noyes, Plum Island, Mass. Printed in Germany. The lighthouse and vicinity were well photographed over the years and numerous postcards views were made. This circa 1915 card shows how developed the northern section of the island was even 100 years ago. (Postmarked 1919)



Black and white photo print was made by Townview Card Co. Portland, Maine (circa 1950). This camp housed polio victims at one time. It was located in the refuge part of the island on the ocean side of the main road where the pavement ends. All of the buildings in the Camp were removed in the late 1980s. It should be noted that the main structure in the photo was the former Knobbs Beach Life Saving Station built about 1890.

Collaborative Efforts Help Endangered Butterfly in New Hampshire

By Heidi Holman, Wildlife Biologist
New Hampshire Fish and Game Department

As the deep snow of this winter melts away a few species are leisurely beginning their annual cycles, awakening from a long winter's nap. This is true for the Karner blue butterfly (KBB), whose eggs have been covered by the thick blanket of insulating snow after having been laid last July. Little do they know that since last fall biologists have been working to enhance their existing habitat by burning and creating new patches of wild blue lupine, the sole food source of the developing larvae, to feast upon.

The population of KBBs at the Concord Pine Barrens – a U.S. Fish and Wildlife Service conservation easement site located near the airport in Concord, NH – has come back from extirpation in 2000, reaching peak numbers estimated at 2400 adults during the summer brood. This success has been achieved through specific habitat management actions and by augmentation from a captive rearing program. After many years of increasing



FWS Photo

The tiny Karner blue butterfly is listed as endangered on the U.S. Endangered Species list. Its decline is due to habitat loss.

numbers, the population has held steady in recent years, failing to reach even higher levels. This observation prompted biologists to identify new actions that could assist in bringing the population to the goal of 3000 adults, as identified in the federal recovery plan.

With funding from a Cooperative Recovery Initiative Grant, USFWS and the New Hampshire

Fish and Game Department are partnering with the City of Concord, Army National Guard and a local business (Praxair Technologies), to create new patches of lupine to support additional butterflies in proximity to already occupied habitat. Heavy equipment was contracted this winter to remove the tall trees and shrubs. This spring prescribed burning and herbicide application will be completed to further suppress the woody encroachment and make way for grasses and flowers, including the wild blue lupine.



FWS Photo

Public school students from Concord, New Hampshire grew wild lupine in their classrooms and later transplanted their plants to the Karner blue butterfly easement, located near the Concord airport.



FWS Photo

Just as the monarch butterfly's life cycle is tied to milkweed, so too is the existence of the Karner blue butterfly linked to the presence of wild lupine.



FWS Photo

Karner blue butterfly caterpillars feed on wild lupine. Many of the management efforts dedicated to helping this federally endangered butterfly center on creating habitat where wild lupine will grow. In this scene, following the mechanical removal of trees and shrubs, the landscape is further cleared through the application of prescribed fire.

Biologists have called in the assistance of their vast network of KBB supporters including the Concord School Department students (grades K-9) and a collaborative of zoos from across the Northeast to grow a large number of lupine and nectar plants this spring. These partners will plant their seedlings in May and June, providing immediate habitat for the butterfly in these new areas.

Once the lupine is established, butterflies from the captive rearing program will be released to colonize the available habitat. In addition to creating new habitat acres, currently occupied habitat will be enhanced to help bolster the numbers of KBBs in the wild. These combined efforts are poised to bring the NH population of KBBs to the recovery goal by 2017. Stay tuned!

Learn More about the Karner blue here:

http://www.fws.gov/midwest/endangered/insects/kbb/kbb_fact.html

On a Wing and a Prayer:
Nanotags Shed Light on
Epic Wildlife Migrations

By: Nancy Pau, Wildlife Biologist

Wildlife is facing challenges unprecedented in human history, with threats such as climate change, large scale energy development, and disease. In the face of these converging threats, conservationists are realizing that we need to know about the entire life cycle of migratory species. Whereas wildlife research has historically focused on a specific period, such as breeding, we're realizing that we need to understand the full life cycle of animals in order to design effective conservation measures. Recent research has shown that each life cycle has carry-over effects into others. A bird that doesn't breed successfully on their breeding ground or dies during migration may be because of events that happened thousands of miles away on the wintering ground, and vice versa. In the Fall 2013 issue of *The Wrack Line*, I introduced readers to a new technology that had the potential to start connecting these migratory dots. Now two years later, we have learned a lot more about the technology and movement of animals, but also have many more questions.

Nanotags are very small and light radio-telemetry tags that are used to track animal movements. The smallest tag that we use weighs less than 1/3 of a paper clip and is light enough to go on dragonflies. For this project, we used tags that all emit on one frequency, but are individually unique. This allows us to track all individual animals using automated tracking towers that record to computers. In 2014, our network of nanotag researchers deployed over 200 automated towers that track thousands of unique animals from Canada to Virginia along the Atlantic Flyway.

The staff at Parker River was part of the initial pilot project in 2013, and put nanotags on 30 semipalmated sandpipers. We were very surprised when 3 of our birds flew north to the Bay of Fundy. In 2014, we expanded the work, and put tags on semipalmated sandpipers and salt marsh sparrows at Parker River and bats at Great Bay. Below are some findings on our work with semipalmated sandpipers.

Refuge staff and volunteers banded 92 semipalmated sandpipers from July to September, and put nanotags on 22 individuals. We were able to track 21 of these birds at Parker River and 11 of them were detected in southern New England. Here are some questions we were able to answer using data from our nanotag project.

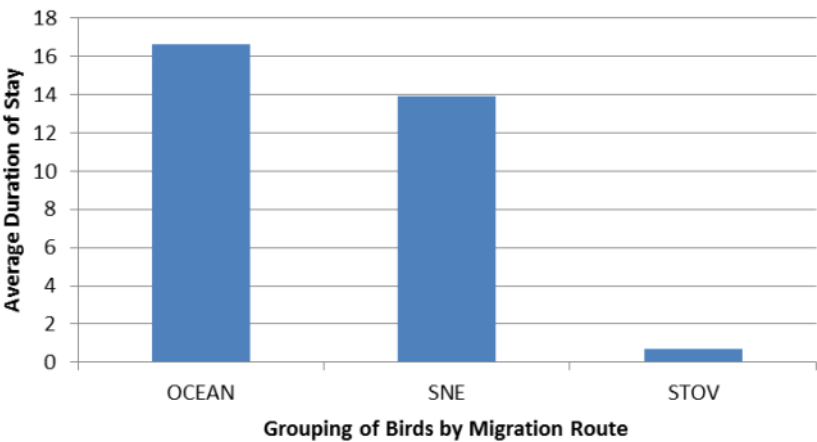


Figure 1. Our shorebird tracking data show that body condition affects what routes birds fly during migration: over water vs. near shore. The OCEAN group (n=10) took a more direct flight to South America and spend the most time foraging in Plum Island, whereas the SNE group (n=8) took a flight path closer to land, and spend 3 days less foraging at Parker River. Finally, the 2 birds that did stop in coastal Rhode Island spent less than one day at Parker River.

Q1: How long do shorebirds stay at Parker River?
A. Parker River and the associated Great Marsh has been designated a Western Hemisphere Shore Reserve Network due to its importance to shorebird migration. Semipalmated sandpipers stay at the Refuge anywhere from 1 to 34 days, with an average stay of 2 weeks. About 1/4 of the birds we tagged stayed 3 weeks or more.

Q2: How do shorebirds use the different habitat at Parker River?
A: It appears that individual shorebirds use a variety of

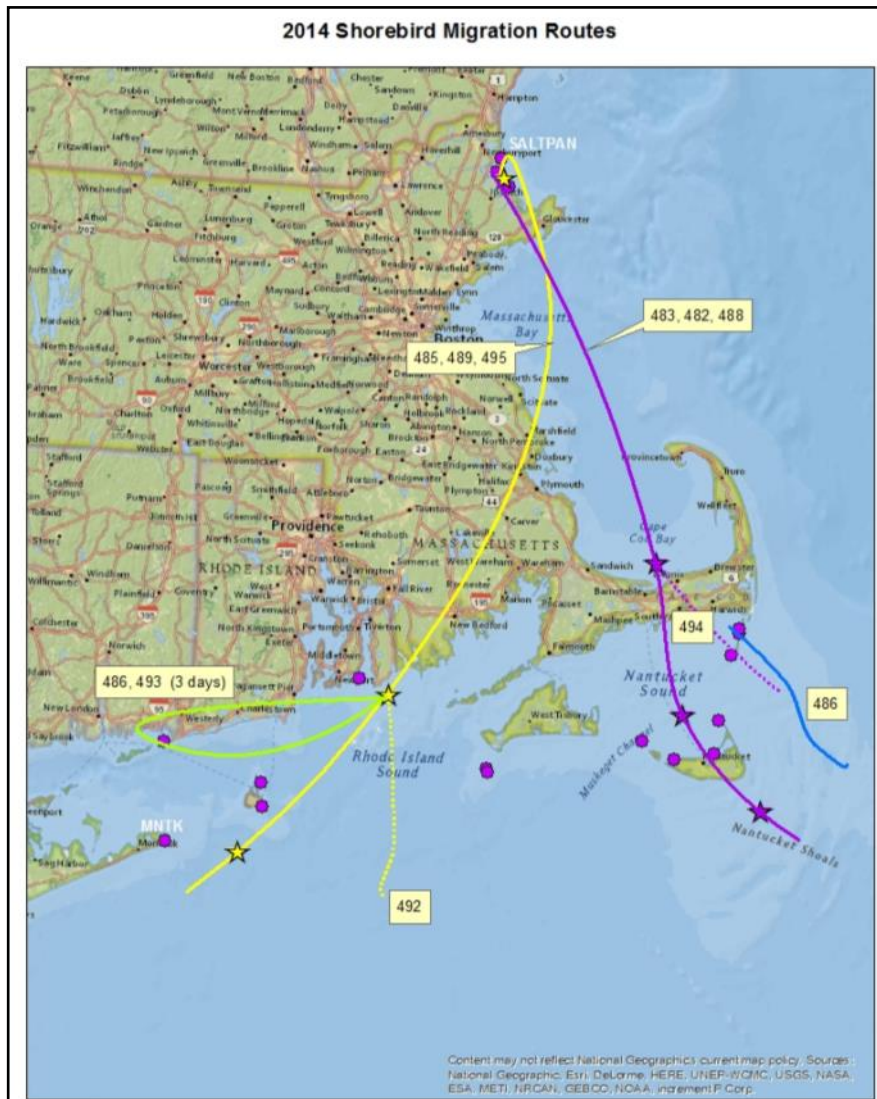
habitats and locations while on Plum Island. Individuals tagged at Bill Forward Impoundment are found using the Stage Island impoundment, beach (Sandy Point, Lot 1, Emerson Rocks), and salt marshes on both side of Plum Island Sound. We are still trying to figure out how tide affects what habitats they use, but that requires some advanced state-space modeling and programming in R (anyone with these skills, please contact me).

Q3: How does Parker River fit into the landscape picture for shorebird use (Where do our birds breed, winter, and where else do they stop)?

A: We don't have a complete picture as the tower network is still expanding. However, we believe our birds are breeding in the Canadian Arctic, stopping over at Parker River, and flying almost 3,000 mile non-stop (directly over the ocean) to French Guiana and Suriname region before continuing to their wintering ground in Brazil. Throughout our expanding network, we know that birds using Hudson Bay and Bay of Fundy are not the same birds that use our refuge; although the ones from James Bay are flying over our refuge.

Q4: What decisions do birds make when they migrate?

A: It turns out birds make a lot of on-the-spot decisions during their migration. For example, birds take different routes depending on their body condition at the time of departure. Birds that have a lot of body fat tend to fly straight over water (getting to their wintering ground faster and picking the best territories), while those that didn't put on as much weight tend to fly closer to land. We saw this with our 2014 data when half the sandpipers flew directly over the ocean, while another half flew closer to land, and was picked up by towers in southern New England (see Figure 1). This observation is corroborated by research findings from the Gulf of Maine in songbirds. With the nanotag data, we're



About half of semipalmated sandpipers were detected by towers in southern New England; but not in New Jersey or Virginia. From this, we can deduct that sandpipers are flying over water (~3,000 miles non-stop) to Surinam and French Guiana; then to their wintering grounds in Brazil. This map shows potential migration routes of birds as they leave Parker River. Not shown on the map are the 10 birds that further out over the ocean.

also beginning to better understand how birds decide when to migrate by comparing time of migration to weather events, time of day, and season.

Here are some more tidbits that we learned about nanotags that you may find interesting, and will help guide us as we design more studies using this emerging technology.

Nanotag technology has shown great potential to answer large-scale movement questions and help conservationists manage birds and bats throughout their life cycle. Traditional banding with

metal bands typically result in 1% of animals being re-caught. Visual bands, like the flags we used on our shorebirds, have about 10% resighting rate (although ours was 16%). We had almost 100% detection with the nanotags; with 50% detection at locations outside the banding sites, which is unprecedented.

Animal behavior and habitat (topography) greatly affect effectiveness of using nanotags to track wildlife. For example, open habitats like impoundments and salt marshes are very good candidates; however, habitats like the refuge beach is challenging because the steep foredune is a big barrier to detection. Height of animal also affect detection range; towers can pick up animals flying high (like during migration) up to 17 km away, but only about 2-3 km for animals on the ground. For animals that are below ground (like salt marsh sparrows that spend a lot of time in ditches and creek), detection range is less than ½ km.

Nanotag technology has great potential to track bats, despite dense tree cover. In 2014, we were able to track 3 of 4 red bats as they migrated across the landscape from Maine to Rhode Island (1 of our bats flew at speeds of 35 miles per hour). We also found that bats adjust their thermal



The alpha-numeric codes on the nanotags allow birders and researchers to relocate animals without capturing them. One of our sandpipers was sighted in French Guiana a month after we banded the bird.

energetics through the season. Bats feed throughout the night (8-9 hours) during summer; but only feed for 30 minutes to 3 hours in the fall. Some bat species are detected very late in to the season, with evidence that they may be hibernating in coastal New England. We will be continuing bat tracking at Great Bay in 2015, helping to answer some critical information about the newly federally listed northern long-eared bat.

Working on this large scale nanotag project has been largely an exercise in humility and faith. It's been a challenge designing a large research project where there are so many unknowns and where we had to have expertise in so many disciplines. My staff and I have been challenged at every turn in this project: from learning to build computers from scratch, to structural and solar engineering, to coding and radio-telemetry science. It has also been extraordinarily exciting and rewarding as we push the bounds of science and begin to understand wildlife in ways that will truly make a difference to their long-term conservation. We have also learned to face the uncertain future with hope as wildlife species continue to debunk what we take as "facts," proving that wildlife is a lot more resilient and adaptable than we give them credit for.



We were able to schedule one of our banding events during World Shorebird Day and give refuge visitors an up close and personal experience with these amazing shorebirds. Visitors, young and old alike, were delighted by these tiny birds that make epic journeys.

Meet Refuge Volunteer Patty Evans!

By Jean Adams, Outdoor Recreation Planner

It is hard to come close to Patty's enthusiasm, energy, and community involvement. I have worked with volunteers a very long time and have met countless numbers of people and I can honestly say that Patty is one of the stand outs. She literally oozes positive attitude. Her boundless energy is infectious and she is quite simply a fabulous person.

I asked Patty to answer some questions and in typical Patty fashion-she responded in spades! You will likely feel like an underachiever after reading her responses (that, or be totally exhausted). How anyone can cram so much into their days is amazing and admirable. On top of that she makes the world's best popovers!

Thank you Patty for volunteering at Parker River. We are so fortunate to have you here!

How long have you volunteered? Do you volunteer elsewhere?

I became a volunteer here at Parker River National Wildlife Refuge after completing the Master Naturalist training program that was offered in 2012. When first I heard about this new program, I instantly knew that it was something I wanted to do. I grew up in Plaistow, NH and live in Seabrook now. But I spent all of my summers as a child at my family's cottage on Parker River, sailing with my family in our restored Cape Cod Cat Boat named "Moby Dick." So, I was already very familiar with this area and its history. I thought that becoming a volunteer at the PRNWR would give me the opportunity to share my knowledge and love of this area with others. I wrote a letter to Matt Poole and was thrilled to learn I had been accepted. It has been a non-stop learning experience for me ever since!

In the two years following the Master Naturalist training program, I have created and hosted a few events at the Visitor Center for the public and also help out with other programs and events at the



visitor center as needed. I can always rely on my fellow Master Naturalists to help out with my events, too. They have presented talks on the Snowy Owl, the natural history of Plum Island and even a presentation on shipwrecks in the area which were thoroughly enjoyed by everyone who attended.

I also volunteer as a Certified International Chili Society (ICS) Chili Judge. The proceeds from all ICS sponsored chili cook-offs are donated to a variety of charities like the Make a Wish Foundation, Special Olympics, Meals on Wheels, American Cancer Society and most appropriately, Ducks Unlimited. I think this last one is very appropriate as hunting is one of the "big six" activities promoted on National Wildlife Refuges!

I am also a proud member of the Pease Greeters, a group of citizens who greet our troops coming and going overseas, at any time of the day or night, at Portsmouth International Tradeport. We provide food and moral support for travel-weary soldiers as their flights stop-over at Pease for refueling. And throughout the year, Pease Greeters volunteer to help out with other charitable events like the Toys For Tots program at area malls. We set up

booths at various local events where people can create personal messages and cards that are sent to troops stationed overseas. Pease Greeters have also donated and delivered over 45,000 pounds of sundry items, snacks, toiletries, games, books, and holiday gifts to soldiers stationed overseas.

Warning: attend just one flight ceremony at Pease and you will instantly be hooked. That's what happened to me!

Another fascinating volunteer opportunity that I participate in is transcribing bird observation cards for the Bird Phenology Program (BPP) (when different species of birds show up and where). This is an extremely addictive activity. Like Lay's Potato Chips... you can't transcribe just one card! Many of the cards are handwritten and some have the most interesting comments added. It is so fascinating to not only read these cards but to know that I am helping, as a "Citizen Scientist", to compile a database that will be used for analyzing migratory routes and bird activity. Already, some of this information is being used to study the effects of climate and environmental changes.

And one more volunteer service that I offer... I can notarize a document for you as a Notary Public in Massachusetts.

What do you do for your chosen career? Do you work fulltime?

Yes, I do. Professionally, I am the Accounting Manager at Winchester Systems, Inc. in Billerica MA.. I earned my accounting degree at Merrimack College over a period of ten years, while working full time. During that time I used all of my math/science requirements for Marine Biology and Environmental Science classes. I spent a week at the Shoals Marine Lab on Appledore Island studying marine biology, took an Ornithology class, and also studied tropical marine biology by taking a winter semester class at Merrimack that ended with a 12-day stay at a field station in Belize. Locally, I am a member of the Joppa Flats Audubon group and have been on many birding excursions with the group in the past. I have also participated in bird-banding seminars at the bird banding station on Plum Island and at the bird-banding station on Appledore Island.

What are your hobbies or favorite activities?

I have been an avid Geocacher since 2003 and have taught an "Introduction to Geocaching" class, and a "Navigating with GPS" class at Assabet Valley Technical High School, as part of the "Assabet After Dark" continuing education program. I used some of that class material to create the events I host here at the Visitor Center. We focus on learning how to use a GPS receiver, navigating the Refuge with a GPS receiver and also on some aspects of Geocaching. Although Geocaching is not allowed in National Wildlife Refuges, PRNWR has a wonderful GeoQuest Trail that was already in place when I became a volunteer. The various locations can be discovered by using GPS receivers to go to specific coordinates to find information stations throughout the Refuge. Visitors answer a series of questions and learn about the unique features in those locations... the Salt Pannes, the cranberry bog, and the Stage Island overlook, for example. And when they return to the Visitor Center, they receive a Junior Refuge Ranger badge for completing the GeoQuest tour. This is a very popular activity during my events.

I am also a photographer in my "spare time." I photograph a wide variety of subjects, but landscapes and seascapes are a favorite for me. I try to convey my strong love of the New England coastline. My family has a long history and solid roots on Cape Ann and Gloucester, having settled in the town of Lanesville in the 1600's. I am a proud descendent of a long line of sailors, fishermen, sail makers and even a marine artist who lived and painted in Gloucester, Fitz Henry Lane, so it is only natural that my love for the ocean shows through in my photos.

My photographs have been on display at the Visitor Center twice as "Artist of the Month" and three have been chosen as winners in the annual Photo Contest that the Photographic Society of the PRNWR sponsors. I am particularly proud of my "First Place – Blue Ribbon" prize for my photo of a Snowy Owl that was about to be released in the Refuge. Currently, my photographs are on exhibit at the Newburyport Five Cents Savings Bank – Yoken's Branch, 1390b Lafayette Road, Portsmouth, NH. *(continued)*

Spring is a Great Time to Volunteer at the Refuge

By Jean Adams, Outdoor Recreation Planner

Do you like to be outdoors? Do you like to talk to new people? Are you handy with a hammer? If so, you might want to consider volunteering at Parker River National Wildlife Refuge.

As the weather warms, the refuge will become busier, the plovers will return, and the Lot 1 visitor center will re-open for yet another season. Volunteers will be needed to staff the center from mid-May to September and Plover Wardens are needed to be on duty from April through mid-August. In addition, the harsh winter weather and the heavy visitation take a toll on the boardwalks and fences. Anyone with a knack for handy work such as fixing broken boards, hammering nails, painting and putting in fence railings might want to consider being a refuge maintenance volunteer.

Some programs, such as the Plover Warden Program, require attending a brief orientation in the early spring. These sessions are conducted in the visitor center auditorium. There is no obligation to become a volunteer if you attend this program, but it will answer many questions you have if you are curious about volunteering.

In addition, the biology division is always looking for help pulling invasive plant species (such as pepperweed). Keep in mind that there is poison ivy, ticks, and the dreaded greenheads on the refuge so those with an aversion to one or all of these might consider something inside, such as data entry.

If you like to do administrative work, you might want to consider our admin desk. As an administrative volunteer, you would answer phones, sort mail, take program reservations, and sell entrance passes. This is a much needed and much appreciated position to fill since the office tends to get busier as the weather gets better. This would be a position for someone wanting to volunteer during the week as opposed to the weekends.

If you are interested in learning more about volunteering for Parker River NWR, please call Jean Adams at (978) 465-5753.

(Patty Evans, continued from page 17))

During the Refuge Naturalist session in 2012, I created photo-documentary slide shows of each session, an exercise that helped me to remember the wealth of information that was presented. Appropriately, photography is also one of the “big six” activities promoted by National Wildlife Refuges! I shared all of these slideshows with my fellow Master Naturalists and some of them are available to view online, on the “Friend of Parker River National Wildlife Refuge” website at: <http://www.parkerriver.org/pages/news.html>

A new Refuge Master Naturalist program just started and will continue throughout 2015. My primary volunteer responsibility with this new group is to create similar photo-documentary slide shows of each session. Secretly, I am thrilled to just be able to tag along with the new group. One of my personal goals is to learn something new every day. And already, in just one session, I have learned so many new things!

Any favorite memories that stand out?

At the 2013 Eagle Festival event, I found instructions for a craft project, an eagle magnet, that I thought would be fun for the children attending the event to make. It was created by gluing loose feathers to a pre-cut foam base to form the head of a bald eagle. Sounds simple, right? By the end of the day, the table and all of the volunteers, including me, were covered head-to-toe with feathers and glue! But my favorite memory from that day was of all the big smiles from the children, and their parents, who were so proud of the bald eagle magnets they made.

Even With the Best of Intentions... Mother Nature May Still Be the Best Provider

By Christopher Husgen, Federal Wildlife Officer

My love of nature has guided where I work and live, and I am very fortunate. I walk, ski, or snowshoe almost every day in the woods behind my house. One morning, at the end of the snowiest winter on record, I was taken aback and deeply saddened by what I found.

While my black lab Watson and I were walking our loop, I noticed him sniffing in one spot longer than usual. I then noticed a small deer lying dead, frozen into the ice of some snow melt. I looked for signs of predation or starvation, but he seemed to be in good condition. I thought he must have starved, as it had been such a severe winter, but I could not see or feel well-defined ribs under his skin. We moved along, and found another dead deer only 50 yards away. It was a larger deer, and a doe. I again returned to the trail, and only 15 yards away, I saw a large buck lying dead in the snow. All looked otherwise healthy, but appeared to have died as they were just walking along.

When I returned home, I told my wife about our walk, and we were both very sad about the loss of the deer. Guessing that they had died of starvation, we wanted to help any other deer out there. I called my friend, and neighbor, New Hampshire Conservation Officer Graham Courtney, and told him about what I had seen. He grew up in those woods and knows them well. That afternoon, we went out after work and looked at those that I had found, and then found three more dead deer. We both wondered what had happened to the deer?

Graham and the state wildlife biologist, Patrick Tate, walked out in the woods the next morning. They found six more dead deer for a total of twelve. Pat told him that the deer had not died of starvation; rather, they had died because someone had fed them.

Pat had examined the fat surrounding the organs, and the bone marrow, and found the deer in

otherwise good condition. When he looked at the contents in their digestive system, he learned what had happened. The deer had consumed hay, deer pellets, and corn, and died of enterotoxemia. He explained that the digestive system of the deer lacks the ability to digest high carbohydrate foods after subsisting on a very low carbohydrate diet throughout the winter. In the winter, deer naturally browse on twigs, and nuts, and their system is well adapted to those foods. When they suddenly consume high energy foods, the microbes that digest their food don't change quickly enough, and the deer die a very painful death within 24 hours of consuming the human-provided foods.

Well intentioned people, me included, can unwittingly cause serious harm to wildlife. The Conservation Officer did let the community members know about what had caused the deaths, and a local TV station also aired a story aimed at better educating the public to avoid similar situations in the future.

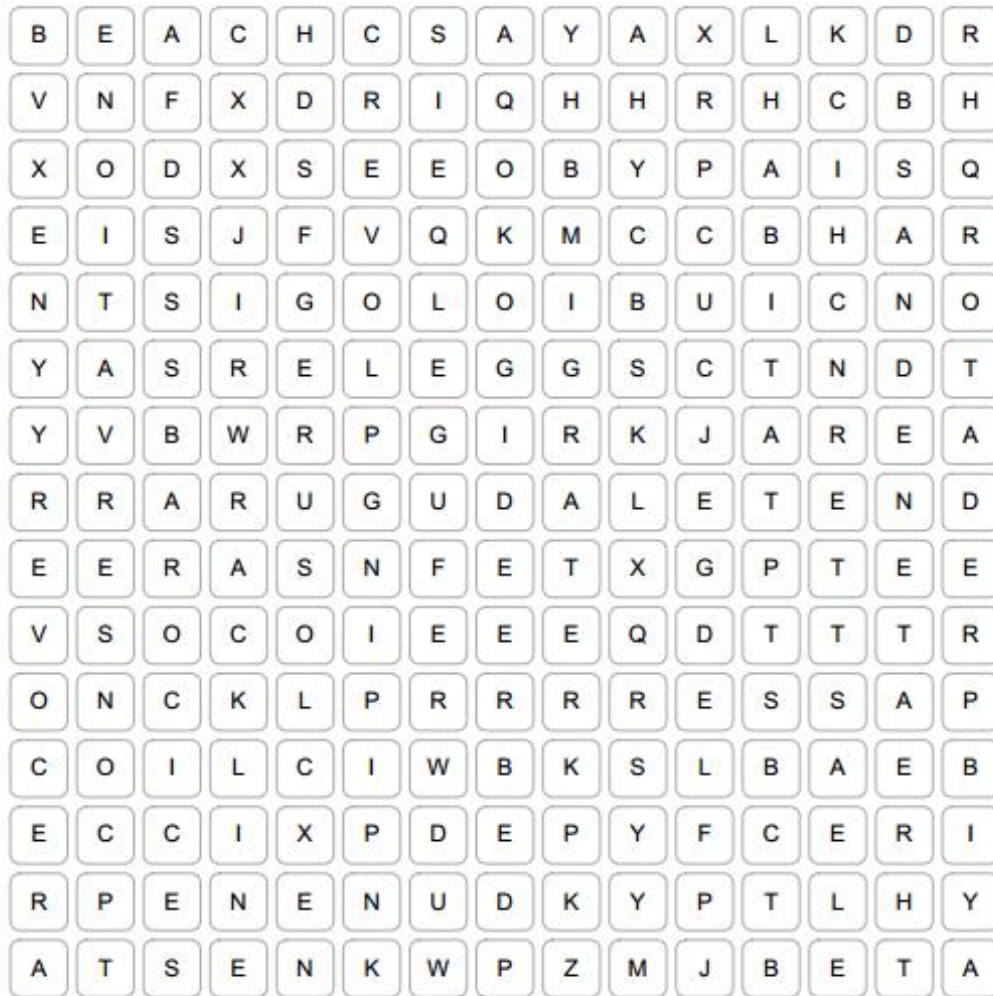
Parker River NWR prohibits the feeding of wildlife, whereas before it may have been one of many regulations I have been responsible for enforcing, it now holds greater meaning for me in the wake of this occurrence in our community.



Christopher Husgen's black lab, Watson, was the first to notice the fallen deer in the woods behind the officer's home in NH.

Piping Plover

Word Search



BEACH
LEASTTERN
BREED
NEST
PREDATOR
RECOVERY
BIOLOGIST

EXCLOSURE
HABITAT
EGGS
SAND
CHICK
WRACKLINE
DUNE

MIGRATE
REFUGE
FLEDGE
THREATENED
CONSERVATION
PIPINGPLOVER

A Winter to Remember:

Snow-magedon!

By Frank Drauszewski, Deputy Refuge Manager

As we all know too well, record snow amounts this past winter buried the refuge with drifts up to 10 ft. The storms of February, with the associated northwest winds, blew a lot of the snow that fell upon the salt marsh and re-deposited it onto the refuge road. Our staff was not able to keep up with or remove the snow with the equipment we have on hand. Local area heavy equipment was all being used, and nothing was available to rent, so the refuge had a large John Deere front end loader transported up from Blackwater NWR in Maryland. It took over two weeks to open the road to the Hellcat area with the extra heavy equipment and equipment operators brought in from other refuges.

Initially, we could only open the road as far as parking lot two. Intrepid staff ORP Jean Adams and LE Officer Christopher Husgen snow shod to Sub-HQ, documenting the scene with many photos. Working south one bucketful at a time, we advanced the open road to lot 3 and finally, with another week of pushing and moving the white stuff, we opened to Hellcat.

I can remember 23 years' worth of winter storms on the refuge and must say this year's snow amounts and drifting are the most memorable. In other words, if you like snow, this was the best year on record. Thanks to all of our regular winter visitors for their patience and understanding with our snow-magedon / road closure situation.

The Wrack Line, official newsletter of Parker River National Wildlife Refuge, is generally published on a quarterly basis—fall, winter, spring, and summer.

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On Facebook:

<https://www.facebook.com/ParkerRiverNWR?fref=ts>

Editing & Layout: Matt Poole

Content contributed by Refuge Staff, Volunteers, & Partners

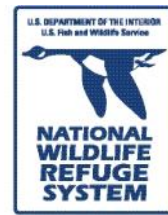


Photo: Jean Adams/FWS